LESSON 1:
in the beginning, the screen was dark, or
chicks dig unix, or
through the looking glass into windows
Topics to Cover Today

- Who's this guy teaching you?
- What will this class cover?
- How will it be structured?
- What's expected from you?
- Bulletin boards and email
- UNIX basics
- Windows miscellany
- Work for next week
Who am I?

- Sean Cusack
- Cooper Alumnus, BSE class of 1998
- 14 years industry programming experience, a lot more on personal time
- Previously of Wall Street, currently starting my own software firm
- Volunteered to teach CS classes here at Cooper
- Teaching 2 of 3 credits to you: UNIX/C/Python
Book List

- OPTIONAL: *Python Programming*
  Michael Dawson
  Third Edition

- OPTIONAL: *The C Programming Language*
  Kernighan & Ritchie
  Second Edition

- OPTIONAL: *C: A Reference Manual*
  Harbison & Steele
  Fourth Edition
What will this class cover?

- Learning how to use the UNIX, PC, and Mac environments so that you can make use of everything computer-related at Cooper
- General problem solving skills
  - Reduction
  - Iteration
  - Stoichiometry
  - Indirection
- Overview of how computers physically work
- Information rights
- Learning the basics of C Programming
- Learning the basics of Python programming
- Computer graphics interfaces
- And depending on how far we get:
  - Robotics
  - Video games
How is the class structured?

- Lectures every week, same place and time unless otherwise noted
- Time Structure
  - 1 hour lecture
  - 5 minute break
  - 1 hour lab period
  - You may stay to work on homework
- Lecture Notes, Projects, Updates, Quiz Info, all available on Moodle
- Projects due every couple weeks
- Tests? Maybe...
Grading

● Projects: 70% of the grade
  – Due at the *beginning* of the class, 17:59:59.999
  – Extra Credit available
  – Each week late is one full grade off
    (Turning projects in by end of class due is one week late, no prorating)

● Class Participation: 30% of the grade
  – Raise your hand, ask questions, do well and work independently on labs, answer questions, get involved
Honor Policy

• Students *are* encouraged to help each other
• They are *not* to ever copy work, in part or whole
• Specifically for “code”, this will be discussed in more detail later
• Doing so not only risks the grade in this class but your academic status at Cooper
• Not to mention, it robs you of needed practice
• Don't give out your password to *anyone*
What is expected of you?

- Show up on time for class
- Do your homework
- Put in your best effort for your projects
- Ask questions if you don't understand, or if you think anyone would benefit from asking
- Don't kill yourself on extra credit
- Learn and have fun
Where do I go first?

- Get your packet of computer information from the Computer Center
- Try the examples from class again, to make sure you can do them yourself
- Do your homework
- Patiently await the next breathtaking installment of this class
Moodle

• The Cooper Union Bulletin Board
  – On Windows, bring up Internet Explorer, Mozilla Firefox, Opera, Safari, or Chrome, and type http://moodle.cooper.edu/
  – Search for “CS102E”
  – All lecture notes, quiz data, project information, etc. will be posted under the School of Engineering ==> CS102E Computer Science for Engineers 2012
  – Homework is listed separately from lecture notes there

• Use this for general-purpose questions
  – Clarifying something about the nature of a project
  – Correcting something
  – Nothing specific about your own project
Webmail

- Windows-based email
- https://webmail.cooper.edu
What is UNIX?

- You may have heard, “it's like Windows, but different”. Not very helpful, is it?
- CLI: Command Line Interface
- For those that used DOS, it is very similar
- CLI's require you to type commands in order to take actions, rather than point, click, and drag icons
Mac vs PC

- The computers in 806H can run either
- For this class, use the Mac OS
- Next week, we'll try PC instead, so we can tell the difference for ourselves
Logging onto UNIX

- If you're sitting at a Solaris machine, just fill in username and password
- If you're sitting at a Windows machine:
  - Use puTTY
  - Double-click on students
  - At the “user name” or “login” prompt, type your user name
  - At the password prompt, type your password
    - Your typing will not appear on the screen, this is normal, so people can't look over your shoulder
    - If you make a mistake and have to use the BACKSPACE key, and you're using puTTY, use SHIFT-BACKSPACE
- For a Mac:
  - Find the "Terminal" program and click on it.
  - Type: "ssh students -l username" where "username" is your unix username (and email id). Don't type your password until it asks for it.
    - Once on students, also type "export TERM=xterm" otherwise nano won't work.
- If it doesn't work, make sure that CAPS LOCK is not on and try again
- If it still doesn't work, ask a Computer Center Operator to help you out
- Note that you can only log in to Cooper's UNIX environment from the CUCC
  - If you need home access, ask for "ssh access from home"
  - We can also provide you with free software to run a UNIX-like thing on your own PC
$ 

- If all goes well, a banner message about not smoking or drinking in the Computer Center appears 

- Then, the ominous dollar-sign: $ | $ 

- This is the “command prompt”, it means “what would you like me to do now?”
Commands

- Space-separated
- Verb-noun
- `ls`
- `nano`
- `cat`
- `mv / cp`
- `mkdir`
- `bash`
  - autocomplete
  - `ctrl c, s, q, z (and fg)`
Directories

- Boxes
- Trees
- Absolute
- Relative
- \(pwd\)
- \(cd\)
Directories as Boxes

/directory/subdirectory1/file1
/directory/subdirectory2/file2
/directory/subdirectory2/file3
Directories as Trees

/directory/subdirectory1/file1
/directory/subdirectory2/file2
/directory/subdirectory2/file3
Absolute and Relative Directions

- Let's say we want to move “student” from:
  /universe/virgosupercluster/localgroup/milkyway/sol/earth/
  northamerica/newyork/41cooper/8thfloor/806/desk3/
  to:
  /universe/virgosupercluster/localgroup/milkyway/sol/earth/
  northamerica/newyork/41cooper/8thfloor/805/desk4/

- Or we can say that we are “at desk 3 in 806”, and we want to move the student from “where we are”, out “one container” to 806 and another “container” to “8thfloor”, then inwards “one container” to “805” and then another to “desk4”
Dotdot

cd /universe/etcetcetc/8thfloor/806/desk3
ls
student
mv student ..../../805/desk4/
ls
cd ..../../805/desk4/
pwd
/universe/etcetcetc/8thfloor/805/desk4
ls
student
Slashdot

- The outermost layer: /
- The current layer: ./
- One layer out from the current layer: ../
- Two layers: ../../

- “This layer”'s “outer layer”'s “self”: ./.././
- That is, single-dots don't change location
- Allowing us to say this instead of “/”: /.
Copying files to and from robin

- “cp” is the copy file command, “scp” means “secure” copy, meaning that it copies things from machine to machine encrypted, so the data cannot be read by others

- If you are on a Mac, and not logged into robin, and you have a file "foo.txt" in your current directory, and want to put it in your "cs102e/homework-1" directory over on robin:
  
  - scp ./foo.txt students:cs102e/homework-1/

- If you want to copy "cs102e/homework-1/foo.txt" from robin to your Mac:
  
  - scp students:cs102e/homework-1/foo.txt ./
File editing on a Mac

• You can use nano on the local Mac or on robin, using Terminal

• If the file is local on the Mac, you can edit it using any word processor

• Using Macs in the classroom is new this year, I will be looking for a more comp-sci friendly way of accessing files on robin, but for now, use pico or nano :-}
PC

• We are using the Mac today, but just in case you need to do your homework later and can't use a Mac, the following slides will cover copying files there..
Winscp

- On windows, click on START.
- Find Winscp.
- Run it.
- A CUCC operator will help if you cannot find it.
- You can also use winFTP (or good 'ol FTP if you like typing or dislike mice)

- Please note, you can only transfer files to and from Windows/robin.cooper.edu from the CUCC.
Session

- Click on Session in the top left.
- Type in “robin” for hostname.
- Type in your UNIX login and password in the appropriately named fields.
- Hit Login.
Directory Listings

- Up comes a directory listing of your UNIX and Windows directories.
- You can navigate either side just like any browser.
What a Drag

- And like most windows products, drag-and-drop is the key.
- Pull from the UNIX side into the Windows side, or pull from the Windows side into the UNIX side.
Winscp Copy

- Make sure that you are in "text transfer mode" when dragging files to and from unix/windows, *not* "binary transfer mode"
Notepad++

- You can create and edit files on robin, through Winscp, if you are using Windows
- To edit a file, right-click an select Open With "Notepad++"
Samba

- Log on to students.cooper.edu via Terminal/putty
- cat samba_readme.txt
- Run `smbpasswd`
  - Use the password from that file as current
  - Change it to something else (perhaps your UNIX or webmail password)
- Only do these things once, never again
- **NOTE:** you cannot access samba from home. Scp/ssh yes, samba no.
Samba on Windows 1

My Computer → Tools
Samba on Windows 2

\students.cooper.edu\username

Do NOT check “reconnect at login”
Samba on Windows 3

Use your UNIX username and the new password you set for samba.
Samba on Windows 4

You can now access UNIX files on windows
Samba on Windows 5

**DO NOT FORGET** to disconnect before leaving!
Samba on Mac OS X 1

Finder → Go
Samba on Mac OS X 2

smb://students.cooper.edu
Samba on Mac OS X 3

UNIX username and new Samba password

Do NOT check “remember password”
# Samba on Mac OS X 4

<table>
<thead>
<tr>
<th>Name</th>
<th>Date Modified</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>core</td>
<td>Today, 12:25 PM</td>
<td>3.90K</td>
</tr>
<tr>
<td>cs</td>
<td>Oct 22, 2010, 10:40 AM</td>
<td></td>
</tr>
<tr>
<td>cs102e</td>
<td>Oct 22, 2010, 10:39 AM</td>
<td></td>
</tr>
<tr>
<td>cs102e-fall-2010</td>
<td>Today, 3:09 PM</td>
<td></td>
</tr>
<tr>
<td>foo</td>
<td>Today, 2:07 PM</td>
<td></td>
</tr>
<tr>
<td>htdaccess-cgi</td>
<td>Oct 27, 2010, 4:27 PM</td>
<td></td>
</tr>
<tr>
<td>htdaccess-hide</td>
<td>Oct 27, 2010, 4:33 PM</td>
<td></td>
</tr>
<tr>
<td>nano-2.2.5-sol10-x86-local</td>
<td>Oct 27, 2010, 5:33 PM</td>
<td>2.97K</td>
</tr>
<tr>
<td>port</td>
<td>Oct 22, 2010, 10:32 AM</td>
<td></td>
</tr>
<tr>
<td>pub_html</td>
<td>Oct 22, 2010, 9:57 AM</td>
<td></td>
</tr>
<tr>
<td>samba_readme.txt</td>
<td>Yesterday, 10:30 AM</td>
<td></td>
</tr>
</tbody>
</table>
Samba on Mac OS X 5

DO NOT FORGET to Eject your share!
Submitting Homework

• After running the `/opt/bin/cs102e-fall-2012-mkaccount` program that is mentioned in the homework, you will have a `cs102e` directory inside your home directory
  (Note, only run the mkaccount program *once* for this *one homework*, you never need to run it again)
• Inside that directory will be `lab-1`, `homework-1`, `web-2`, etc
• The lab directories are yours to do with as you please, and will have purpose later
• The homework-# directories are for submitting homework
• If the file you want to submit is in the correct homework-# directory, then it's considered submitted, you don't need to run anything or click anything or email anything
• Only put what you want to submit in the homework-# directories, don't leave other clutter in there - it makes it harder for me to grade
• Also, please be careful to never move or delete your assignments - if I haven't graded one yet and you delete or move it, then I can't grade it, and you may have to redo it from scratch
• Additionally, don't edit or even (to be safe) open old projects - if you by accident save the file again, then it will mark it as new, and I may mistake it as having been late
• If you want to look at a previous project, make a copy of the file elsewhere first, then open that
• The homework-# directories also have a feedback and common directory inside of them
• Common will be used at a later time
• Feedback will eventually contain your grade for that assignment, when I finish grading it, of course :-)